

Abstract

Semiconductor device with a cooling element

- 5 A semiconductor device comprising a semiconductor component (12), particularly a power laser diode bar, disposed on a cooling element (20), wherein the cooling element (20) contains in its interior a cooling channel (26) for conducting a coolant. The coolant channel (26) comprises in at least one region (32) microstructures for effective heat transfer to the coolant. The semiconductor component (12) substantially completely overlaps the region (32) of the cooling channel (26)
- 10 comprising the microstructures. Disposed between the semiconductor component (12) and the cooling element (20) is an intermediate support (16) so arranged and configured that it compensates for mechanical stresses between the semiconductor component (12) and the cooling element (20) occurring as a result of differing thermal expansions of the semiconductor component (12) and the cooling element (20). The material of the cooling element (20)
- 15 particularly preferably has a high modulus of elasticity such that the compensation takes place substantially within the elastic strain regime.

Figure 1

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